

## References

## Technical Characteristics

Signal	Sampling freq.	Resolution	max. tension in output	Sources
Acoustic #1	25 kHz	16 bits	+/- 10V	Microphones, tape player, DAT,
Acoustic #2	25 kHz	16 bits	+/- 10V	Microphone, tape player, DAT, E.G.G
Oral airflow	6.25 kHz	16 bits	+/- 10V	Sensors
Nasal airflow	6.25 kHz	16 bits	+/- 10V	Sensors
Pressure #1	6.25 kHz	16 bits	+/- 10V	Sensors
Pressure #2	6.25 kHz	16 bits	+/- 10V	Sensors
Auxiliary input	6.25 kHz	16 bits	+/- 10V	EMG, ...

Accessories	Model	Description	Characteristics
Loudspeaker	TEAC LS-X8MK2	4" Woofer + 1" Tweeter	8 W, 30W RMS, 60W music power
Microphone of the mouthpiece	AKG C419	prepolarized condenser, hypercardioid	20-20000Hz, Max sound pressure level 126 dB, phantom powering*
Microphone	STATEX TOA PRIMO	capsule electret, cardioid	20-20000Hz, Max sound pressure level 138 dB, phantom powering*
Microphone	AKG C 1000S	prepolarized condenser, hypercardioid	50-20000Hz, Max sound pressure level 137 dB, phantom powering*

\* phantom powering integrated in EVA. Requires battery if used with other equipment

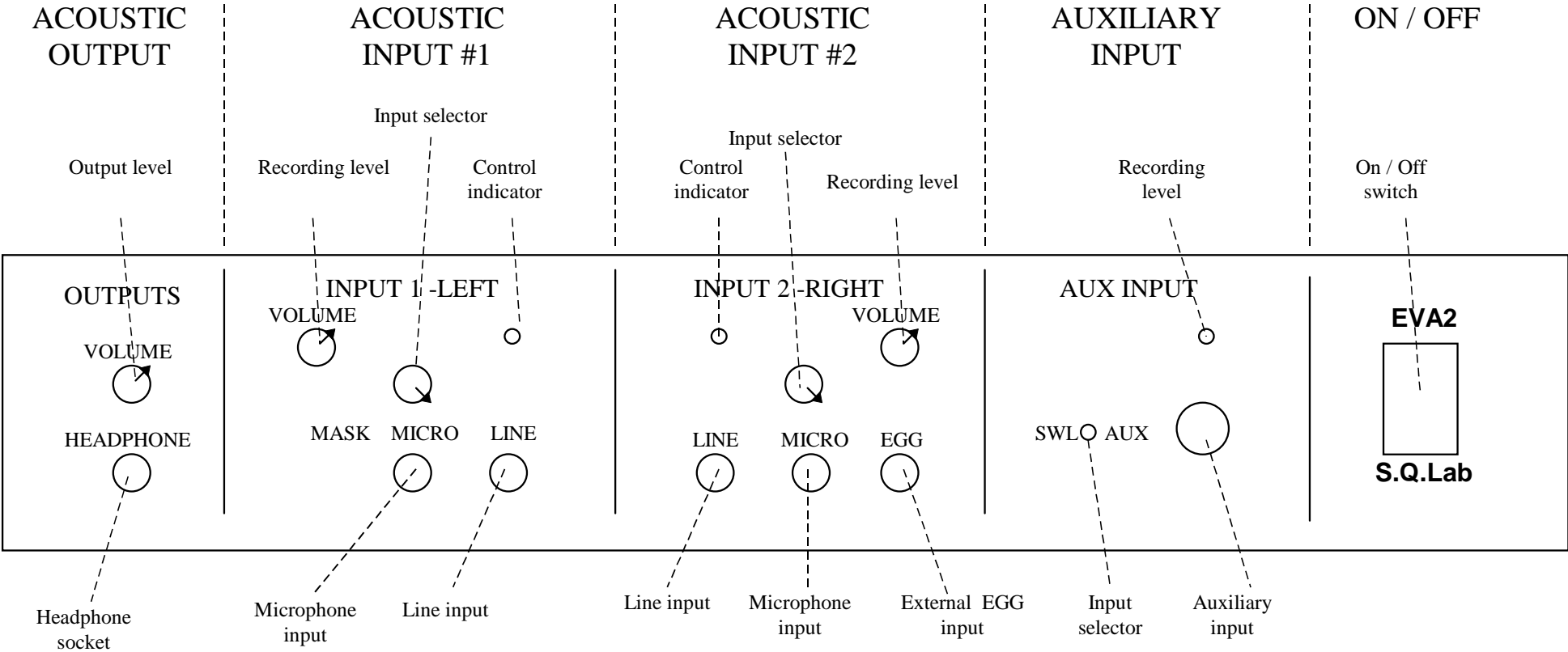
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## General presentation of the interface

Most of the operations (power on, settings, input selection) are performed from the front panel of the interface. It is composed by 5 parts :

- Acoustic outputs “ OUTPUTS ” for the audio playback
- Acoustic input #1 “ INPUT 1 - LEFT ” for the recording of sound signal.
- Acoustic input #2 “ INPUT 2 - RIGHT” for the recording of sound signal or EGG.
- Auxiliary input “ AUX INPUT ” for the recording of an auxiliary input like EMG,...
- ON / OFF switch



front panel

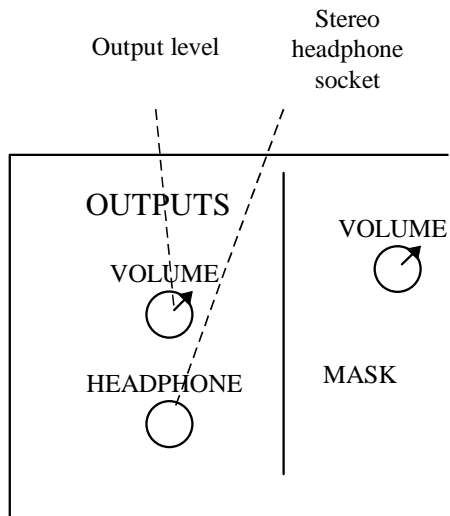
## Power switch

To switch on/off the equipment, use the power switch on the right side of the front panel

## Audio playback

This part manage the audio playback and the recording on magnetic tapes.

### AUDIO OUTPUT



### Loudspeaker :

Connect the loudspeaker on the **OUTPUTS - 1 LEFT** jack socket on the rear panel

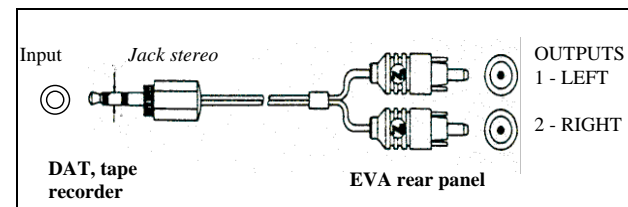


do not connect the loudspeaker to the headphone input on the front panel

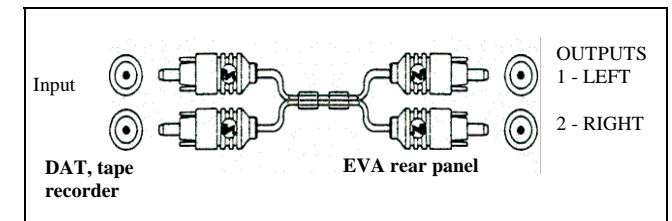
*Note :* Connecting the headphone, cuts automatically the loudspeaker output.

### Lines outputs :

The EVA line outputs, located on the back panel allow to record on audio tapes the sound signals stored in the computer. To do so, just connect the EVA line outputs to the tape recorder or DAT inputs, launch an audio playback from the computer, and start the recording on the tape recorder.

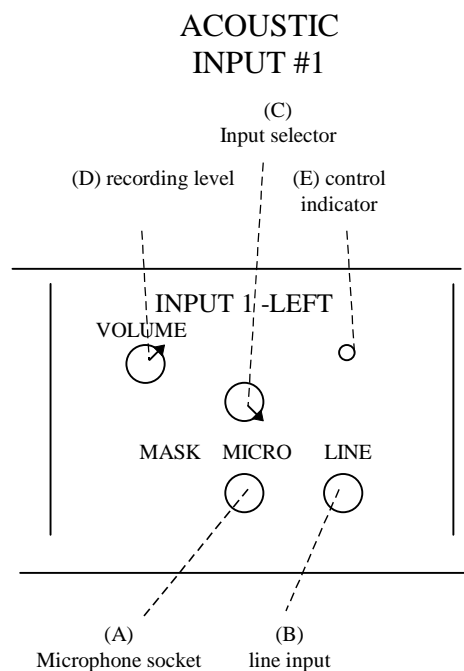


or



## Acoustic input #1

This part allows to record sound with channel #1 (“ Left Input ”).



A : Socket for connecting an electrodynamic or electrostatic microphone (integrated phantom powering).

B : Line input for connecting a tape player or a DAT

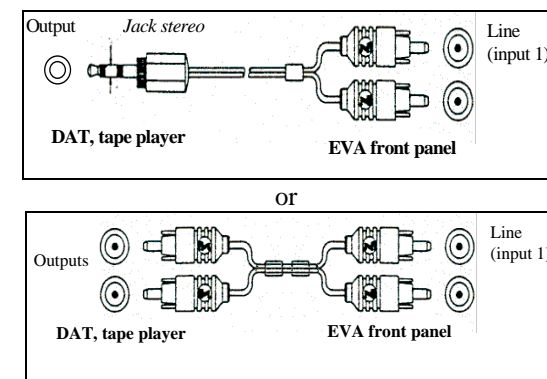
C : To choose the acoustic source between :

- mouthpiece microphone (position “ MASK ”)
- on stand microphone (position “ MICRO ”)
- line input (position “ LINE ”)

D : To set the sound input level

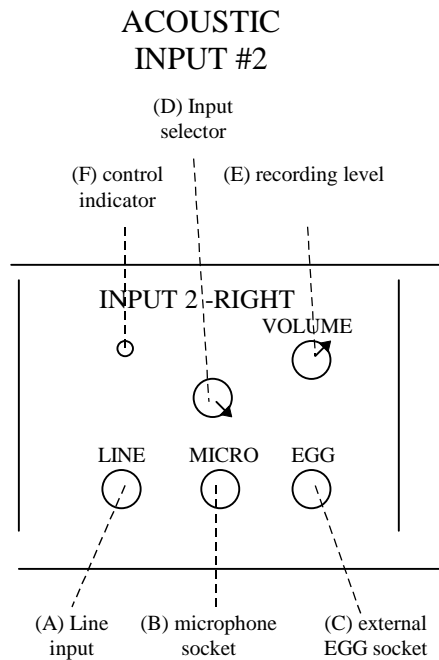
E : To verify if an acoustic signal is recorded. The indicator stays off when :

- ⇒ the input selector is in a bad position. ( ex : selector on “ LINE ” while the on-stand microphone is used)
- ⇒ input level is too low



## Acoustic input #2

This part allows to record sound with channel #2 (“Right input”).



A : Line input for connecting a tape player or a DAT

B : Socket for connecting an electrodynamic or electrostatic microphone (integrated phantom powering).

C : Socket for an external Electro-glottograph connection

D : To choose the acoustic source between :

- line input (position “LINE ”)
- on stand microphone (position “MICRO ”)
- external Electro-glottograph (position EGG)

E : To set the sound input level

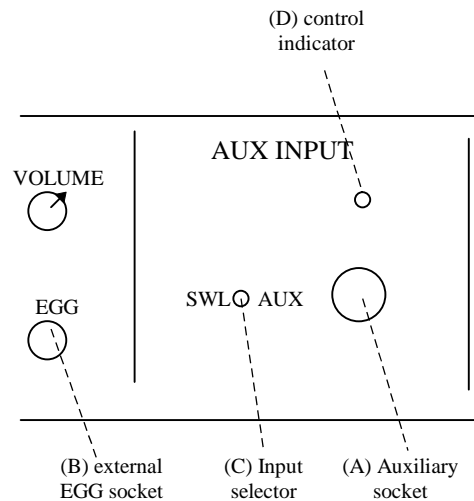
F : To verify if an acoustic signal is recorded. The indicator stays off when :

- ⇒ the input selector is in a bad position. ( ex : selector on “LINE ” while the EGG is used)
- ⇒ input level is too low

## Auxiliary input

Allow to record an auxiliary signal.

### AUXILIARY INPUT



A : Auxiliary input for connecting an external equipment.

B : Socket for an external electroglottograph connection.

C : To choose an input source between :

- auxiliary input (position “AUX”) to get a signal from an external equipment
- swallowing signal (position “SWL”) to catch the low frequency signal pour of the electroglottograph connected to the acoustic input #2.

D : To verify if an acoustic signal is kept. The indicator stays off when :

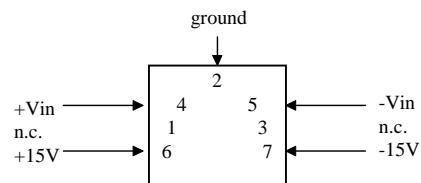
- ⇒ the input selector is in a bad position.
- ⇒ input level is too low

### Auxiliary input :

The auxiliary output allows to get a signal coming from an external device (EMG, other electronic sensors...). Moreover, it is able to supply electric power supply if this device requires it. The socket on the auxiliary input is a 5 pins DIN female. Connection is described on left. Auxiliary input is differential (+Vin et -Vin) to get the signal, and supplies +15V/ -15V power, and ground.

### Specifications :

- maximal current : 50mA



Auxiliary socket shown from the user side

## Aerodynamic sensors

The aerodynamic measures are recorded with the mouthpiece. All the settings concerning the offset zeroing and the choice of scales are performed by the computer. However, to record sound from the mouthpiece, it is necessary to turn the **INPUT-1 LEFT** selector on **MASK** position.



- Do not open the mouthpiece
- Do not dismantle the grids of the airflow ducts

Mask and tubes are disinfected but not sterilized.

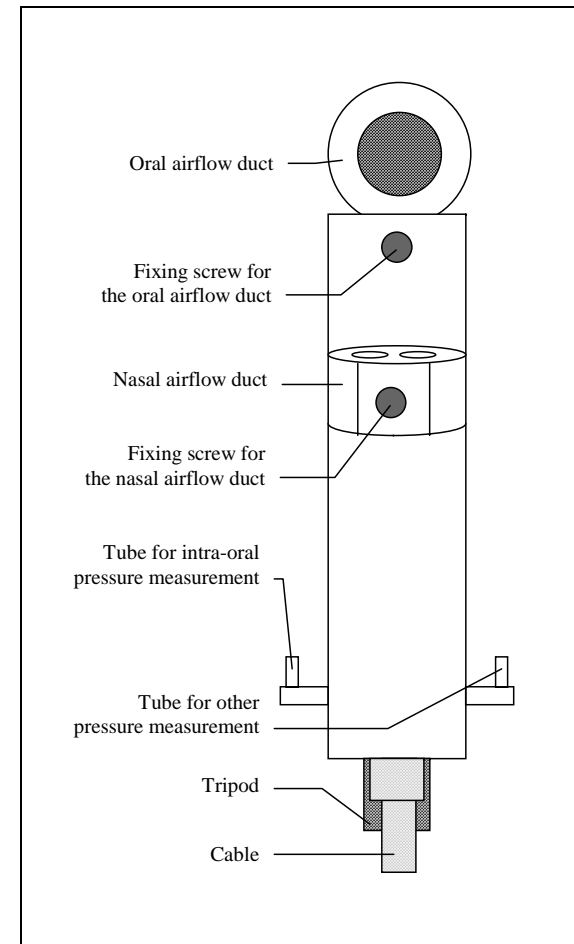
## Air flow sensors

Airflow sensors are built with grid pneumotachographs, realized for giving a wide dynamic, a small dead volume for a large frequency response and a good linearity for all the articulatory and respiratory contexts. Their resistance to the flow is about 10 Pa for an airflow rate of 1 l/s, which represents a range of 1/100<sup>th</sup> of a standard subglottic pressure (around 10 hPa).

## Pressure sensors

Pressure sensors have these characteristics :











- piezoresistif bridge
- heat and gravity compensation
- response time : 0.1 ms
- linearity (typical : 0.01%, max. : 0.1%)
- damage pressure : 1900 hPa



*Mouthpiece Schema*




## Menus and keyboard Accelerators

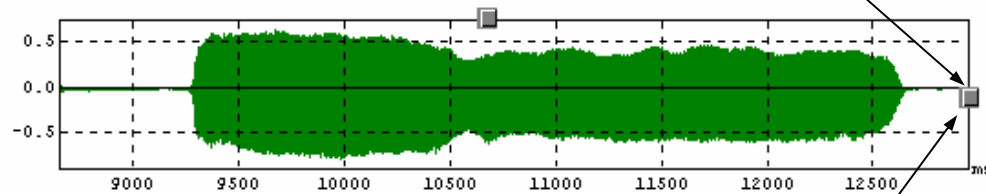
Menu	Keyboard Accelerator	Toolbar	Action
File   New	Ctrl N		Create a new document
File   Open	Ctrl O		Open an existing document
File   Save	Ctrl S		Save the active document
File   Information	Ctrl I		Patient information
File   Start Recorder	R		Start real time recorder
File   Playback	P		Start or stop playback
File   Print	Ctrl P		Print the active document
Edit   Copy	Ctrl C		Copy the selected graph or array and put it in the clipboard
View   Zoom out	-		More general View (horizontal axis)
View   Zoom in	+		More precise View (horizontal axis)
View   Full Page	*		Full page view (horizontal axis)
View   Move Left	←		Move the view to the left
View   Move Right	→		Move the view to the right
View   Scale out	Ctrl -		More general View (vertical axis)
View   Scale in	Ctrl +		More precise View (vertical axis)
View   Full Scale	Ctrl *		Automatic vertical scale
View   Move Up	↑		Move up the selected graph
View   Move down	↓		Move down the selected graph
Action   Measures	M		Call or hide the measure cursor
Tools   Options	O		Software options

## Signal Manipulation


### Horizontal Zoom

To display a more precise view along the horizontal axis :

- click on Zoom In Icon 
- or use zoom handle
- or choose the Menu View / *Zoom in*
- or press the keyboard accelerator [+]



To display a more general view along the horizontal axis :

- click on Zoom Out Icon 
- or use zoom handle
- or choose the Menu View / *Zoom out*
- or press the keyboard accelerator [-]

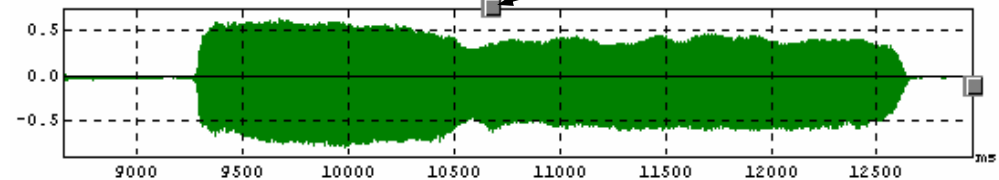
To display the complete view along the horizontal axis :

- move up the zoom handle
- or choose the Menu View / *Full page*
- or press the keyboard accelerator [\*]

### Horizontal displacement

If the view has been zoomed in, you can move along the horizontal axis :

- use displacement handle
- or choose the Menu View / *Move left (right)*
- or press the keyboard accelerator [←] or [→]



You can also move temporally the signal by using a drag ( click on the signal, maintain the left mouse button down and move the mouse horizontally ).

### Saving view

If you are satisfied by the present view and you want to keep the settings, save the document :

- click on 
- or choose the Menu *File / Save*
- or press the keyboard accelerator Ctrl [S]

## Vertical zoom

To display a more precise view along the vertical axis :

- put the focus on the signal
- choose the Menu View / *Scale in*
- or press the keyboard accelerator Ctrl [+]

To display a more general view along the vertical axis :

- put the focus on the signal
- choose the Menu View / *Scale Out*
- or press the keyboard accelerator Ctrl [-]

To display the signal with automatic scales :

- put the focus on the signal
- choose the Menu View / *Full Scale*
- or press the keyboard accelerator Ctrl [\*]

## Vertical displacement

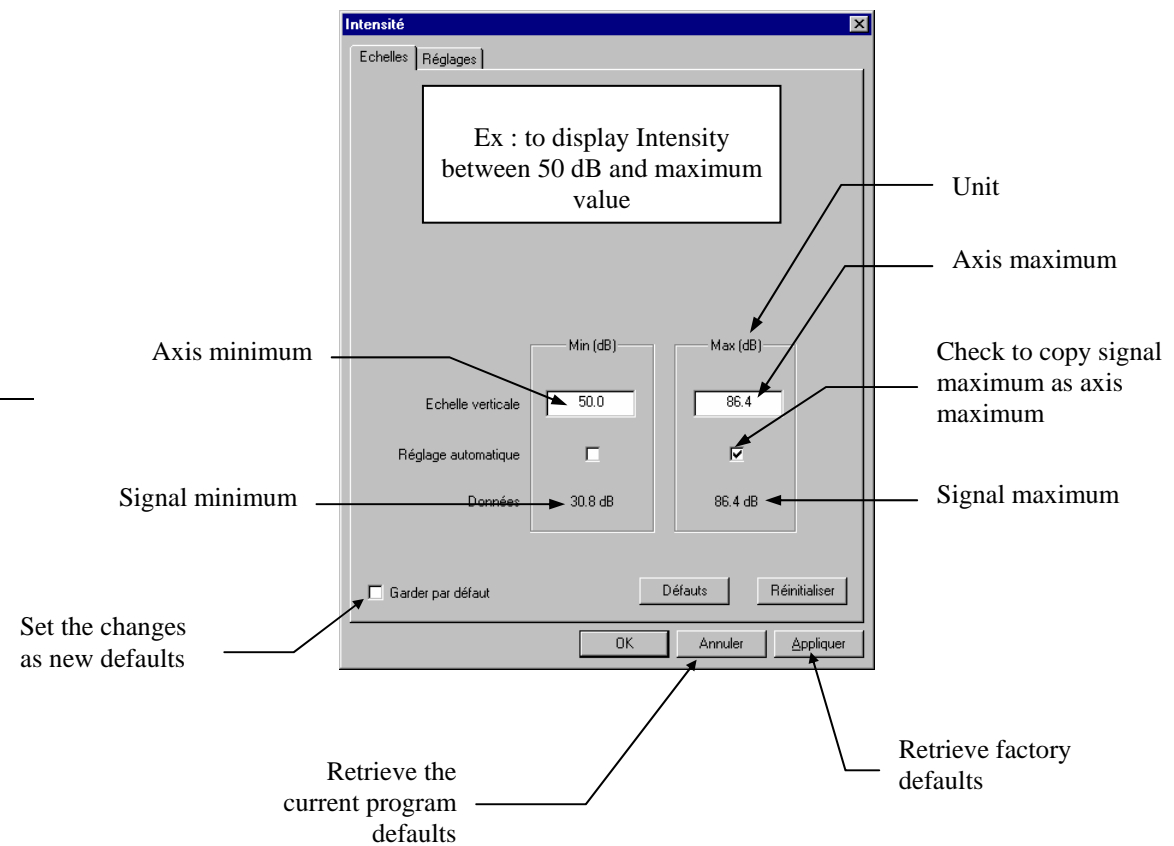
You can move along the vertical axis :

- put the focus on the signal
- choose the Menu View / *Move Up (Down)*
- or press the keyboard accelerator [↑] or [↓]

## Setting scales

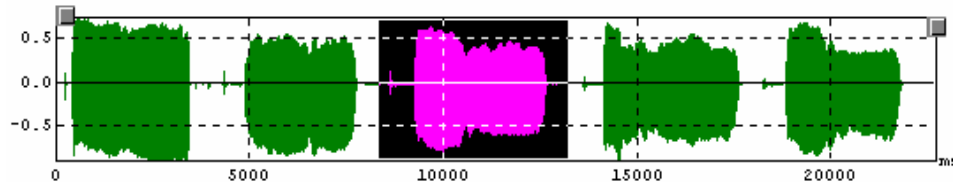
To change precisely scales:

- put the focus on the signal
- call Properties Menu (mouse right button)
- select Scales Page

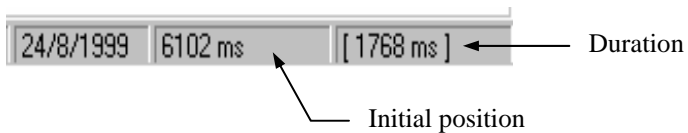


## Selection of a part of signal

Move the mouse pointer on a signal window. Hold down the « shift » key. Click simultaneously the left mouse key, and move along the signal. The selected signal appears in reversed colour inside a black zone.



To check selection position and duration, use information displayed in the status bar:



You can listen to the selected part by clicking on this icon



You can zoom on this signal

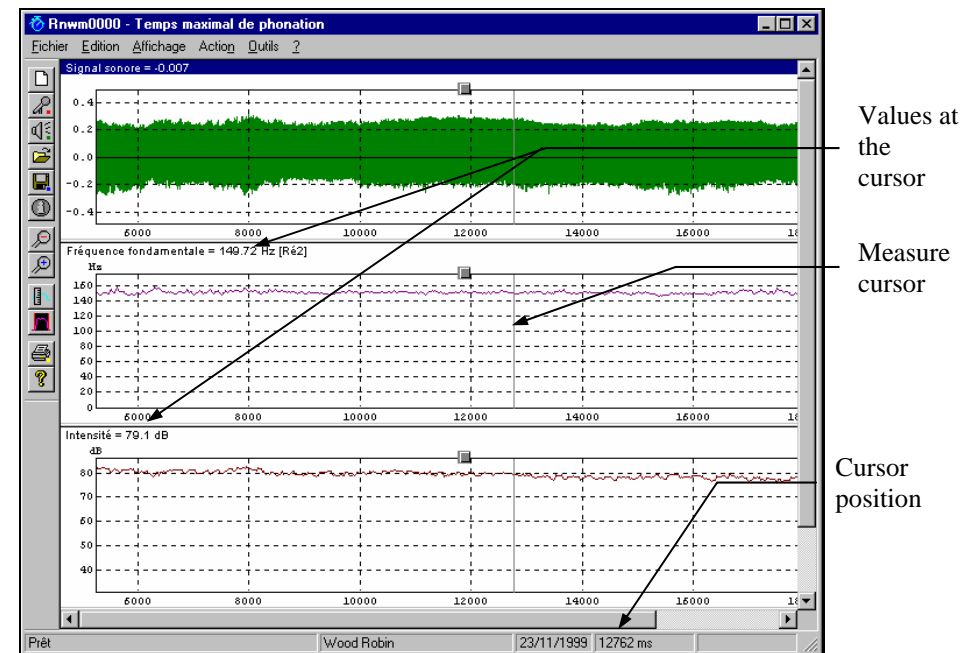


- by clicking on this icon
- or by choosing the Menu View / *Zoom In*
- or by pressing the keyboard accelerator Ctrl [+]

## Measurement



Select the measuring icon. The measure cursor appears. Select this cursor and move it (maintain the left mouse button while moving). The temporal position and the signal values appear.



To hide the cursor, click again on

